Remarks/Arguments:

Claims 1-15 and 26-29 are presently pending, with all pending claims rejected. Claims 16-25 are herein withdrawn in accordance with applicants' election dated June 1, 2007. Applicants herein amend claims 1, 5, 9, 26, 28, and 29 and cancel claims 6 and 15. Support for the claim amendments can be found throughout the specification as originally filed. For example, see paragraphs 0029, 0044, and 0074. No new matter is added. Reconsideration is respectfully requested in view of the above amendments and the following remarks.

Claim Objections

Section 1 of the Office Action recites that "Claim 5 is objected to because of the following informalities: in line 4 after 'seeds' a period ---.--- is required." Applicants herein amend claim 5 such that it ends in a period. Applicants contend that claim 5, as amended, no longer includes an informality and, therefore, respectfully request that the objection to claim 5 be withdrawn.

Claim Rejections Under 35 U.S.C. § 101

Page 1 of the Office Action recites that "Claims 28-29 are rejected under 35 U.S.C. 101." Applicants herein amend claims 28 and 29 such that they are directed to a tangible computer readable storage medium, which is statutory subject matter. Accordingly, applicants respectfully request that the rejection of claims 28 and 29 under 35 U.S.C. § 101 be withdrawn.

Claim Rejections Under 35 U.S.C. § 102

Page 6 of the Office Action recites that "Claims 1, 3, 6-8, 26 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Hiramatsu et al U.S. Pub No 20030147358 A1 [(Hiramatsu)]." Claims 6 is canceled, thereby rendering the rejection of this claim moot.

Applicants contend that claim 1, as amended, is allowable over Hiramatsu. Claim 1 is directed to a method for processing source data for transmission over a wideband signal such that the wideband signal has reduced discrete power spectral density (PSD) components. The wideband signal includes wideband signal pulses. Claim 1 includes at

least one feature that is not disclosed, taught, or suggested by Hiramatsu. The features of claim 1 include:

> generating data symbols responsive to the source data;
>
> transforming one or more of the data symbols into a frame including one or more orthogonal frequency division multiplexing (OFDM) symbols;
>
> selectively inverting one or more individual OFDM symbols within the frame responsive to a random data sequence; and
>
> modulating the wideband signal pulses of the wideband signal with the selectively inverted frame of OFDM symbols.

This means that data symbols are generated responsive to source data. One or more of the data symbols are transformed into a frame including one or more OFDM symbols. Individual OFDM symbols within the frame are then selectively inverted responsive to a random data sequence for modulation onto wideband signal pulses. This process reduces/removes lines (i.e., discrete components) in the power spectral density (PSD) of ultra wideband (UWB) signals in each sub-band, which is equivalent to minimizing the PSD in each sub-band. See paragraph 0062 of the application as originally filed.

Hiramatsu fails to disclose, teach, or suggest at least the step of "selectively inverting one or more individual OFDM symbols within the frame responsive to a random data sequence as set forth in claims 1. The Office Action relies on paragraphs 50-55 of Hiramatsu for this feature. In particular, the Office Action relies on the multiplexing section described in these paragraphs to teach the claimed selective inversion of individual OFDM symbols. Applicants respectfully traverse the rejection for the reason set forth below.

In the Office Action, it is stated that "a multiplexing section is the same as the claimed "selectively inverting (see page 3 [0050-0055]). (Note that in page 8, paragraph 1, of the current application, the inverter 112 is described as a multiplexer therefore the multiplexer of Hiramatsu is functionally equivalent to the inverter)." Applicant respectfully disagrees with the premise of this statement. In particular, page 8, paragraph 1 states "The inverter 112 may be a multiplexer (not shown) that passes either an OFDM symbol or the inverse of the OFDM symbol, e.g., as inverted by an inverter

circuit (not shown), responsive to bits of the random or pseudo-random number sequence." Thus, the subject application does not equate the inverter to a multiplexer but to the combination of a fixed inverter and a multiplexer. The inverter of the subject invention requires some capacity to invert a signal.

Hiramatsu is directed to a radio base station apparatus and communication terminal. Hiramatsu describes techniques for performing either code multiplexing or time multiplexing on an OFDM signal and a CDMA signal. When performing time multiplexing, an OFDM signal is combined with a CDMA signal using a multiplexing section that alternates between passing the OFDM signal and the CDMA signal. *See paragraph 54 and figure 8 of Hiramatsu.* Thus, the OFDM signal is not altered by the multiplexing section, let alone selectively inverted as called for by claim 1.

When performing code multiplexing, the OFDM signal is first spread by mapping chips of a spread signal onto the OFDM signal to obtain an OFDM-CDMA signal. The OFDM-CDMA signal is then added to the CDMA signal by a multiplexing section. *See paragraphs 54-56 and figure 9 of Hiramatsu.* Thus, the multiplexing section adds two signals together, rather than selectively inverting OFDM symbols within a frame.

Additionally, the spread of the OFDM-CDMA signal in Hiramatsu does not randomize the OFDM signal (which would result in the reduction of discrete components). This is because the synchronization data in an OFDM signal is a fixed signal that is framed on a frame by frame basis. Thus, even if the spread signal is mapped, it is not randomized when observed frame by frame. This is unlike the invention set forth in claim 1, which features the selective inversion of OFDM symbols within a frame. Since the inversion is performed on symbols within a frame, synchronization data is also selected or not selected to be inverted at random. Consequently, all data sent in accordance with the method of claims 1 would be randomized (which results in the reduction of discrete components).

For the reasons discussed above, Hiramatu fails disclose, teach, or suggest each and every limitation of claim 1. Accordingly, applicants respectfully submit that claim 1 is allowable over Hiramatsu and request that the rejection of claim 1 be withdrawn.

Claims 26 and 28, while not identical to claim 1, include the features discussed above that make claim 1 allowable in view of Hiramatsu. Accordingly, applicants respectfully request that the rejection of claims 26 and 28 be withdrawn.

Dependent claims 3, 7 and 8 each depend from claim 1 and, thus, include the limitations of claim 1. Accordingly, applicants respectfully submit that claims 3, 7, and 8 are allowable for at least the reasons discussed above that claim 1 is allowable.

Claim Rejections Under 35 U.S.C. § 103

Page 8 of the Office Action recites on page 8 that "Claims 2, 4, 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu...in view of Batra et al U.S. Pub No 2005/0190817 A1." The deficiencies of Hiramatsu discussed above are not remedied by the addition of Batra. In particular, Batra fails to disclose, teach, or suggest selectively inverting one or more individual OFDM symbols within the frame responsive to the random data sequence. Accordingly, applicants contend that claims 2 and 4 (which depend from claim 1), claim 27 (which depends from 26), and claim 29 (which depends from claim 28), are allowable for at least the reasons that their respective base claims are allowable.

Page 9 of the Office Action recites that "Claims 9-10 and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al...in view of Gerakoulis et al U.S. Pub No 2005,0013240 A1." Claim 15 is canceled, thereby rendering the rejection of this claim moot.

Claim 9 includes at least one feature that is not disclosed, taught, or suggested by Batra in view of Gerakoulis. Claim 9 includes the following features:

> a mapper configured to generate data symbols responsive to the source data;
>
> a transformer coupled to the mapper, the transformer configured to transform one or more data symbols into a frame including one or more orthogonal frequency division multiplexing (OFDM) symbols;
>
> an inverter coupled to the transformer, the inverter configured to selectively invert one or more individual OFDM symbols within the frame of OFDM symbols; and

> a wideband transmitter coupled to the inverter, the wideband transmitter configured to modulate the wideband signal pulses of the wideband signal with the selectively inverted frame of OFDM symbols.

This means that a mapper generates data symbols based on source data. A transformer transforms one or more of the data symbols into a frame and an inverter selectively inverts the frame of OFDM symbols. A wideband transmitter then modulates wideband signal pulses with the selectively inverted frame of OFDM symbols.

The Office Action acknowledges that Batra does not teach an inverter coupled to the transformer. The Office Action, however, asserts that Gerakoulis teaches the claimed inverter. Applicants respectfully disagree.

Gerakoulis is directed to a system and method for generating orthogonal codes. Gerakoulis discloses a code spreading technique using Quadratic Residue (QR) codes. Each QR code includes multiple chips. During operation either the QR code or an inverse of the QR code is applied to a symbol to spread the symbol. This expands each symbol into multiple chips. See paragraph 0033 of Gerakoulis. The application of an orthogonal chip code or an inverted version of the orthogonal chip code to a signal is not equivalent to selectively inverting one or more individual OFDM symbols. This section of Gerakoulis does not, however, disclose, teach, or suggest, inversion of one or more individual symbols. In fact, Gerakoulis is entirely devoid of selectively inverting one or more individual OFDM symbols within a frame responsive to a random data sequence as called for by claim 9.

Accordingly, applicants contend that claim 9 is allowable over Batra in view of Gerakoulis.

Claims 10 and 12-14 depend from claim 9 and, thus, include all of the limitations of claim 9. Accordingly, applicants submit that claims 10 and 12-14 are allowable over Batra in view of Gerakoulis for at least the same reason that claim 9 is allowable.

> Page 11 of the Office Action recites that "Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al...in view of Batra et al ...and in further view of Jones et al U.S. Pub No 2002/01869585." Claim 5 depends from claim 1 and, thus, includes all of the limitations of claim 1. The addition of Jones

fails to make up for the deficiencies of Hiramatsu in view of Batra. Namely, selectively inverting one or more individual OFDM symbols within the frame responsive to the random data sequence. Accordingly, applicants contend that claim 5 is allowable over Hiramatsu and Batra and in further view of Jones and respectfully request that the rejection of claim 5 be withdrawn.

Page 12 of the Office Action recites that "Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al...in view of Gerakoulis et al...and in further view of Jones et al..." Claim 11 ultimately depends from claim 9 and, thus, includes all of the limitations thereof. The addition of Jones fails to make up for the deficiencies of Batra and Gerakoulis. Accordingly, applicants contend that claim 11 is allowable and respectfully request that the rejection of claim 11 be withdrawn.

Conclusion

Applicants respectfully submit that the claims are in condition for allowance in view of the above amendments and remarks. Applicants earnestly solicit allowance of the application.

Respectfully submitted,

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